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Marl Deposits in Ontario, Quebec, New Brunswick and  
Nova Scotia.

R. W. ELLI, LL.D., F.R.S.C.

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## MARL DEPOSITS IN ONTARIO, QUEBEC, NEW BRUNSWICK AND NOVA SCOTIA.<sup>1</sup>

By R. W. ELLS, LL.D., F.R.S.C.

### THE MARL DEPOSITS OF EASTERN CANADA.

The presence of shell-marl in the provinces of Ontario and Quebec, at many widely separated points, has long been known, and many localities where this material occurs have been described in the Reports of the Geological Survey from a very early date.

Value of marl deposits The chief value attributed to this substance was for many years supposed to be confined to its use as a fertilizer for soils lacking in calcareous matter, since it furnished a ready kind of lime, easily applied, and showing good results in regard to the cultivation of certain crops where its application was carried out with proper judgment.

Within the last few years, however, marl has been found to be especially adapted to the manufacture of the best grades of cement, when mixed with a proper proportion of clay. Large Manufacturing plants for cement manufacturing establishments have been already established at several points and others are in process of construction, more especially in the province of Ontario, where large and valuable deposits of marl occur at many places. Among these may be mentioned the great works at Marlbank, a few miles north of Belleville, and at Strathcona, about five miles northwest of Napanee, where the manufacture of high-grade Portland cement has been prosecuted on a large scale for several years.

The demand for marl deposits conveniently situated near to railway lines or other means of shipment has increased

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very largely. Enquiries are frequently made as to the existence of these deposits, and in order to present in a readily accessible form such information as is available from the published reports of the Geological Survey, some of which are long out of print and others not convenient for reference, the present paper has been prepared. While it is not maintained that the subject has been exhaustively treated, since the information relative to the occurrence of this substance increases from year to year as the scope of the Survey's operations is extended, the present paper will incorporate all available information on the subject in regard to its occurrence in the provinces of Ontario, Quebec, New Brunswick and Nova Scotia, taken from the published reports of the Geological Survey and from other sources of information, brought down to the present time.

Fresh-water marl occurs usually in marshes and shallow lakes, and generally contains the shells of several species of fresh-water mollusks. In the *Geology of Canada*, 1863, a good description of the mode of occurrence and physical characters of this material is given, which may be here quoted.

Although belonging to the present geological period, this marl is not always of recent formation; inasmuch as the beds of it are sometimes overlaid by peat, or by a soil supporting a growth of large trees. At other times however, the marl covers the bottom of shallow lakes or ponds, and is evidently in the process of deposition. It appears to be formed by the waters of springs highly charged with lime, which is at first held in solution as bicarbonate but is deposited when these waters come to the air. It is thus similar in its origin to the deposits of calcareous tufa, which occur in many places where such calcareous springs flow over earth, rocks and vegetation, instead of falling into lakes or marshes. The presence of carbonate of lime is a necessary condition of the development of shells, and various species of mollusca abound in such waters. These by their remains, which often form a considerable portion of the deposits, give to them the name of shell-marl, which is frequently applied. This substance is white and earthy in its aspect, and, unless mingled with clay, is a nearly pure carbonate of lime, which from its finely divided state is well adapted to serve as a dressing for such soils as are deficient in



calcareous matter. When calcined, marl yields a nearly pure and very white lime, well adapted for mortar and for other uses. In many parts of Vermont large quantities of lime are thus manufactured. The marl is moulded in the shape of bricks which are dried and burned in a kiln."

"When pure, marl may be used as a substitute for prepared chalk or whiting in cleaning metals and for similar purposes. In *Uses of marl* many parts of the country it is commonly employed by the people for whitewashing their buildings. It has also been used for the production of carbonic acid gas in the manufacture of soda-water and other aerated waters in place of the pulverized chalk or marble dust which is generally employed."

Marl deposits are numerous in many of the lake bottoms throughout the province of Ontario. They are also found at *Distribution* various points in the province of Quebec, though, as a rule, such deposits are not so large as in the former province. Further east in New Brunswick this material also occurs at several points around the Bay des Chaleurs, and also near the city of St. John, but the occurrences are still less abundant than in Quebec, while in Nova Scotia shell-marl, in so far as at present known is comparatively rare. It may, however, be remarked in connection with the maritime provinces that many lakes which should naturally contain marl are supplied with extensive deposits of infusorial earth, this material being very abundant in the lakes which are scattered throughout the *Cobequid* range in Nova Scotia, and also in the eastern portion of the province including the island of Cape Breton. In New Brunswick, also, large and valuable deposits of infusorial earth have long been known to occur in the southern and east portions of the province. This material has recently come into considerable demand and several large lake-deposits have been quite extensively worked, the output being principally shipped to points in the United States.

The successful manufacture of Portland cement which in Ontario is destined apparently to utilize many of the *deposits* of fresh-water marl found in the province, *Portland Cement* the proper admixture of the marl with certain proportions of *lime*. These materials after mixing thoroughly are burned, and the resulting compound very finely ground, the success of the operation

being due to a very careful series of experiments which have been carried on for some years till the proper adjustment of materials and the right degree of burning and subsequent reduction to an almost impalpable powder has been reached.

#### ONTARIO.

Among the largest deposits of the marl, some of which have already been utilized on an extensive scale, may be mentioned the following localities: At Marlbank in the township of Hungerford, on the line of the Bay of Quinte railway the great works of the Deseronto Cement Co. are located. The raw material is derived from the beds of White and Dry lakes, the deposit extending over several square miles and having a depth in places of at least 20 feet. Large works in connection with this company are also located at Strathcona, formerly Napanee Mills, which is about five miles northwest of the town of Napanee, the capacity of the plant being over 100,000 barrels annually.

Another very important deposit is situated in the bottom of Shallow Lake, Keppel township, county of Grey, about nine miles from Owen Sound on the west side of Georgian bay. The property here comprises nearly 600 acres, the marl having a thickness of from one to six feet, with an average depth of four feet, underlaid by clay with a thickness of two feet.

Another large deposit is found in Williams lake in the township of Holland, in the same county, near the line of the Toronto, Grey and Bruce Ry., and also near Durham which is also convenient to railway communication.

Marl also occurs on lots 25 and 26, ranges VII and VIII, Flos township, Simcoe county, but the thickness and extent of the deposit is not yet definitely known, though apparently quite large. This area lies a short distance to the southeast of Georgian bay.

Large deposits of excellent marl are found in the counties of Peel and Dufferin. In the first-named county a deposit in the fourth and fifth concessions of the township of Caledon, in close proximity to the railway, is reported as covering about 350 acres with an average

depth of 13 feet, overlaid by a deposit of peat from two and a half to six feet in thickness. This is near Orangeville East Garafraxa station. In Dufferin county on lot 1, range B, East Garafraxa, there is a deposit of marl extending over at least 20 acres with a depth of six feet. Large plants are contemplated for working these areas.

**Peterborough** Further east, at Lakefield, near Peterborough, there is an area of marl lands amounting to about 800 acres, at what is known as Buckley's Lake, where the marl deposit is reported to be 20 feet deep. Large areas of excellent peat are in close proximity, and the district is connected by rail with the town of Peterborough.

**Sheffield Twp.** The deposit at Marlbank has already been referred to; **White Lake** but in the township of Sheffield other large areas of marl have been reported which should be of value. Among these may be mentioned the following—In White lake and on the brook flowing from it to Beaver lake, as also on the fifteenth and sixteenth lots of the second concession, and on the twelfth lot in the third and fourth concessions. The deposit on the first named is stated to extend over at least 200 acres with a thickness throughout the greater portion of at least ten feet, the bottom of the deposit not being reached, having a thin covering of soil with a luxuriant growth of grass.

The second of these deposits extends over an area estimated at from 300 to 400 acres, but the thickness was not ascertained. It is covered by an accumulation of peat with a thickness of four feet or more in places.

**Storrington,** In the township of Storrington, about ten miles north of the city of Kingston, there is a large deposit of marl occupying the bottom of **Loughborough Lake** lake, more especially the southeastern portion. The depth of water is not great, and the marl extends over many acres of the lake bottom, but the thickness was not tested, though the extent of the deposit is apparently very large. The marl is also found in the bottoms of many of the lakes between this place and White lake in Olden township. The Loughborough lake deposit can be easily removed by dredging, and the locality is little more than a mile from the present line of the Kingston and Pembroke railway, while by hauling from Bat-

tersea village on the south side of the lake to the shore of Dog lake, two miles distant, communication can be made with the Rideau canal.

**Belleville** Near the city of Belleville marl also occurs, but no data are to hand regarding its extent. It is presumably not so extensive as the Sheffield deposits.

**Yonge Twp.** In the township of Yonge, near the village of Athens.  
**Athens** and in close proximity to the line of railway from Westport to Brockville, there are several deposits of marl which have never been exploited. One of these is on lot 13, range VIII., and is said to occur over an area of at least 25 acres, with an ascertained depth of seven to fifteen feet. The material is also reported as occurring on lots 7, 8 and 9, range IX, in the bottom of Mud lake, and possibly at other points in the vicinity.

**South Elmsley.** In the township of South Elmsley it is found underlying portions of Bass lake, with a thickness of three to four feet, but the exact extent of the deposit is uncertain. This place is but a short distance from the foot of the Rideau lake at Oliver's Ferry.

**Wilberforce** In the township of Wilberforce, near the Bonnechère  
**Mink Lake** river, and about three miles from the line of the Canadian Pacific railway between Douglas and Eganville, is Mink lake. This lake has an area of over 1,000 acres, the marl being visible at many points and probably occupying most of the bed of the lake. The thickness of the deposit has been proved to be at least nine feet in places and may be much greater in parts of the lake basin. The area can be easily drained so as to expose a large surface of the deposit.

**McNab Twp.** In the township of McNab the lower end of White  
**White Lake** lake shews a large area of the marl, extending over some 700 acres, and ranging from five to seven feet in depth. The area could be readily drained so as to expose a large body of the material, but the distance from the town of Arnprior and railway communication is about eight miles. It is about the same distance to Glasgow station on the Canada Atlantic.

**Ross Twp.** In the township of Ross, several deposits are found in  
**Green Lake** connection with a chain of lakes which extend southeast from Muskrat lake, near Cobden village. On one of these,



known as Green lake, on lot 13, range IV, about one mile north of the line of the Canadian Pacific railway, the marl is found along the shores of the lake, in one place with an exposed extent of five acres, and a depth of from five to twelve feet, and also along the southeast shore of the lake over a space of ten acres, having about the same thickness. On lot 15, range II, in another small lake the marl is found banked up four to five feet near the outlet, extending for several hundred yards, and probably underlying the water of the lake. In several others of this chain of lakes, which extends across into the township of Horton, there are indications of marl, but the extent of the deposits has not been determined. The locality probably represents an old valley of the Ottawa river extending from Pembroke eastward.

**Westmeath** In the township of Westmeath, on lots nine and ten, east front B, shell-marl is seen all round the shores of a small lake, but the depth and extent of the deposit are unknown.

**Emerald Lake  
Temiskaming  
District** On Emerald lake, about five miles west of Opimika narrows, Lake Temiskaming, there is a deposit of marl of unknown depth, but of considerable thickness, since the bottom could not be found on sounding with a long pole. Though the lake is of small size the amount of the marl will here be of importance.

**Lanark** Among other places where the material is found in this province but where the extent of the deposits have not been determined, may be mentioned, lot 13, range IV, Lanark Co., six

**Chalk Lake  
Reach Tp.  
Ont. Co.** acres and seven feet deep; Chalk lake, lots 1 and 2, range I, and lot 1, range II, township of Reach,

**Ontario Co.**, in a lake of 75 acres with a marl bottom, the thickness of which is considerable but not definitely stated; White lake, on lots 18 and 19, range IX, Huntingdon, Hastings Co., the deposit extending out under the waters of the lake, the extent unknown, but found to be 30 feet thick in

**White Lake  
Huntingdon Tp.  
Hastings Co.** places; Eramosa branch of Green river, Eramosa township, Wellington Co., the extent of the deposit unknown but reported to be at least three feet thick with a cover-

**Eramosa  
Wellington Co.** ing of three feet of peat; and in Artemisia township, Grey Co., where it occurs over an area of at least 12 acres, with a depth of at least seven feet.

**Sebastopol Tp.**  
**Clear Lake** In the township of Sebastopol, at the lower northwest end of Clear Lake, near the outlet, there is a large quantity of marl, the depth of which has not yet been proved, and it occurs also in several small lakes adjacent. This locality is about eight miles from the Canada Atlantic railway at Eganville.

**MacKay Lake**  
**New Edinburgh** On the shore of Hemlock or MacKay lake in New Edinburgh, Ottawa, marl has long been known to exist, extending over 100 acres or more with a depth of at least five feet. The deposit is, however, largely covered with soil and forest growth, but has been locally used to some extent in the manufacture of white bricks.

The localities mentioned for the province of Ontario do not profess to describe the occurrences of marl for all portions of the area. Doubtless many deposits occur at various localities, the details of which have not yet reached this Department, but sufficient has been stated to show that the material exists over a great area and frequently in very large and economic quantities.

**West**  
**Hawksbury** In the vicinity of the Ottawa river, on lot 18, range IV, west Hawksbury, there is a deposit the extent of which has not been definitely determined, but it is known to extend over an area from five to ten acres, with a proved depth of 2 to 4 feet, and covered with peat for four feet. It has been locally used as a fertilizer by the settlers in the vicinity.

#### PROVINCE OF QUEBEC.

In the province of Quebec, marl deposits, while not so widely distributed as in Ontario, are also found at points from the western limit to the peninsula of Gaspé.

**Argenteuil**  
**near Lachute** In the township of Argenteuil, lot 3, range I., marl is found occupying the basin of a lake, in depth from five to thirteen feet, overlaid by about nine feet of peat. The area of the overlying peat is about 22 acres. On the same lot, another peat-bog with an area of half a mile from east to west and a breadth of 150 yards occurs underlaid by marl which has a depth of 12 feet. The locality is not far from the line of the Canadian Pacific railway at Lachute.

**Wentworth Tp**  
**Eagle Nest**  
**Lake** On lot 22, range VIII, Wentworth township, marl is reported as occurring in the bed of Eagle Nest lake, which is a short distance south of 16-Island lake, the quantity, not

being stated, but apparently considerable. The nearest shipping point to this place is the line of the Montford Colonization railway near the latter lake. It is also reported as occurring in a small lake on lot 5, range IV, Harrington township, but at present this locality is too far removed from railway communication to be practically available.

Vaudreuil  
Point à Cavagnol,  
Ottawa  
River.

In the seigneurie of Vaudreuil, at Point Cavagnol on the lower Ottawa, a bed of marl extends over at least twenty acres, the thickness being apparently from a foot to a foot and a half. It has been locally used to some extent as a fertilizer. Small deposits of excellent marl are also known to exist in the vicinity of Montreal, as at Thornberry in the rear of Montreal mountain, and on the St. Pierre river, between Montreal and Lachine, which are overlaid in part by beds of peat. The extent of these deposits has not yet been definitely determined, but a company for the manufacture of cement has been established at Pointe Claire.

East of the  
St. Lawrence

In the area east of the St. Lawrence river a small deposit of marl has been long reported as occurring near the foot of Yamaska mountain, near the junction of the road to Granby, with that leading to St. Pie, the thickness of the material being stated to be one foot, and extending over about seven acres.

In the township of St. Armand on lots 156 and 157, about one mile southeast of Phillipsburgh, it is also found in a small lake with a thickness of seven feet, and extending, as far as known, over thirty to forty acres. This locality is in close proximity to the Phillipsburgh branch railway, and also to the shore of Missisquoi bay, through which the Chambly canal passes. The deposit here rests upon a bed of marine shells. In the township of Stanstead it also occurs in a small lake bottom on lots four and five, ranges X and XI, with an area of 20 acres and a reported thickness in places of 30 to 40 feet. This is within a short distance of the village of Stanstead Plain.

A small deposit of marl has recently been reported by Mr Obalski as occurring near the village of Beauport, a few miles east of Quebec city, and also at Lake à la Peinture in the township of Neigette, but the extent of these deposits is not stated.

**Gaspé** In the eastern part of the province of Quebec marl has  
**Matane** been reported as occurring on the south side of the St. Lawrence at a point about five miles below the mouth of the Matane river. The deposit extends over an area of 60 to 70 acres and has a depth of one to two feet, and another deposit occurs at the upper end of the lower Metis lake, the extent of which has not been stated.

In the peninsula of Gaspé several important deposits of this substance are found, especially along the north side of the Bay des Chaleurs. All of these are but a short distance from the line of railway running from Metapedia to Paspébiac. Among localities in this area may be mentioned several lake bottoms lying to the north of the village of New Carlisle Carlisle and in a narrow valley about two miles distant from this place, in all of which and around their margins the marl occurs with a depth of from one to six feet. Further west it is also found in lake bottoms a short distance north of the village of New Richmond of New Richmond near the Great Cascapedia river, Blue Lakes and in what are known as the Blue lakes to the west of that stream, the bottoms of which are apparently filled with this substance. The depth and extent have not been determined, though the quantity appears to be considerable. The latter place is in the Irish settlement.

#### ANTICOSTI.

On Anticosti island deposits of excellent marl were reported by Mr. James Richardson from his exploration of this area in 1856, as occurring at several widely separated points. He states that "the bottoms of all the lakes and small ponds examined, with the exception of such as were surrounded by peat, were more or less covered with it. Marl lake at the northwest extremity of the island near the West point lighthouse, showed a deposit of about 90 acres, with a considerable thickness, which however was not definitely ascertained, and the brook which empties this lake carries down with it to the shore a large quantity of marl as a sediment where it was spread out along the beach for a considerable space."

Another locality noted was about three miles west of South-west Point, where marl was observed along the bank of a brook and



extending inland for a fourth of a mile. It had a thickness of about one foot, and was covered with peat. In a lake about half a mile inland it was seen to cover an area of about 200 acres but the thickness here was not ascertained; and near South Point, which is near the southeast end of the island, about twenty-six miles west of Heath Point, it was also seen along the shore, resting upon the rocks and covered with a deposit of peat about ten feet thick.

#### NEW BRUNSWICK.

Bay des Chaleurs  
Charlo River

In the province of New Brunswick shell-marl in so far as yet known is rarely seen. In the northern portion around the Bay des Chaleurs it occurs on the shore at Belledune underlying peat, the quantity apparently not being very large, and also at Charlo river in the bottom of a small lake where the marl is said to have a depth of nine feet. This deposit has been locally used to some extent as a fertilizer.

Lawlor's Lake  
St. John.

In the southern part of the province, marl occurs at several points. The most important of these apparently is in the bed of Lawlor's Lake, which is about five and a half miles from St. John city on the line of the Intercolonial railway. The marl has been exposed by a partial drainage of this lake, the deposit apparently underlying the whole of the lake basin, but is apparently thickest at the two extremities, especially the eastern, where the depth of the marl is reported as two feet. In places this deposit is associated with peat. In the western part marl has been found in the bed of a small lake a short distance above Burnshaw Brook on the right bank of the Tobique river.

#### NOVA SCOTIA.

Canaan  
near Kentville.

In Nova Scotia no deposits of special economic value have as yet been reported with the exception of an area on the South Mountain ridge at Canaan to the south of the village of Kentville. This has been locally used as a fertilizer for some years and has been to a large extent exhausted. The beds of many of the lakes, especially on the range of the Cobequid mountains as well as in portions of Cape Breton are filled with large deposits of infusorial earth, as is also the case with several lakes in eastern New Brunswick.

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